

WEST NILE VIRUS (WNV) INFECTION

Information

for Clinicians

**CLINICAL
FEATURES****Mild Infection**

Most WNV infections are mild and often clinically unapparent.

- Approximately 20% of those infected develop a mild illness (West Nile fever).
- The incubation period is thought to range from 3 to 14 days.
- Symptoms generally last 3 to 6 days.

Reports from earlier outbreaks describe the mild form of WNV infection as a febrile illness of sudden onset often accompanied by :

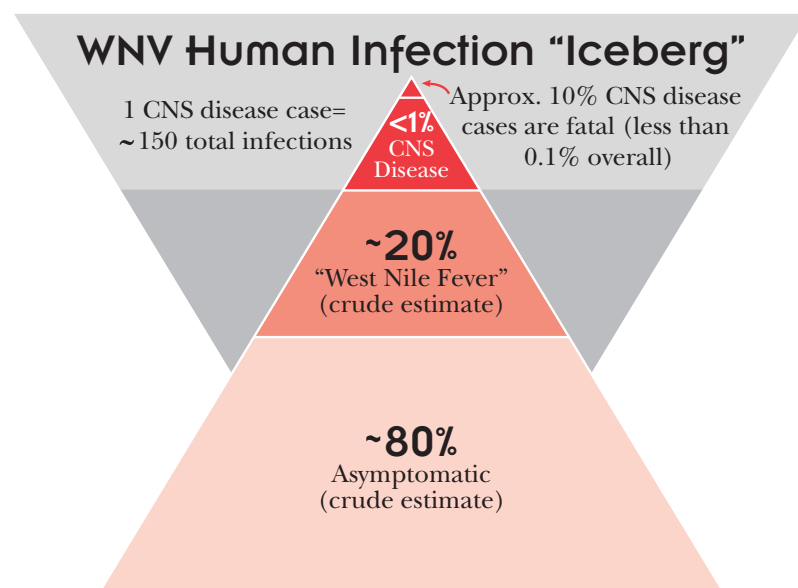
- malaise
- anorexia
- nausea
- vomiting
- eye pain
- headache
- myalgia
- rash
- lymphadenopathy

The full clinical spectrum of West Nile fever has not been determined in the United States.

Severe Infection

About 1 in 150 infections will result in severe neurological disease.

- WNV neurological disease can present as meningitis, encephalitis, or acute flaccid paralysis.
- The most important risk factor for developing severe neurological disease is advanced age.



One distinguishing feature of WNV neurological disease has been pronounced weakness. The weakness has been mistaken for Guillain-Barré or polio.

- Neurological signs and symptoms have also included:

- ataxia and extrapyramidal signs
- cranial nerve abnormalities
- myelitis
- polyradiculitis
- optic neuritis
- seizures

- Some patients have had maculopapular or morbilliform rash or gastrointestinal symptoms.

Although not observed in recent outbreaks, myocarditis, pancreatitis, and fulminant hepatitis have been described.

Clinical Suspicion

Diagnosis of WNV infection is based on a high index of clinical suspicion and obtaining specific laboratory tests.

- WNV, or other arboviral diseases such as St. Louis encephalitis, should be strongly considered in adults ≥50 years who develop unexplained encephalitis or meningitis in summer or early fall.
- Severe neurological disease due to WNV infection has occurred in patients of all ages. Year-round transmission is possible in some areas. Therefore, WNV should be considered in all persons with unexplained encephalitis and meningitis.
- The local presence of WNV enzootic activity or other human cases should further raise suspicion.
- Obtaining a recent travel history is also important.

**DIAGNOSIS****Diagnostic Testing**

WNV testing for patients with encephalitis or meningitis can be obtained through the Utah Department of Health Laboratory (UDOH laboratory) or large reference laboratories. Testing for WNV at the UDOH laboratory is being prioritized for hospitalized patients with viral encephalitis, aseptic meningitis, Guillain-Barré syndrome or acute flaccid paralysis.

Avoid testing the "worried well," or those who have a viral infection without any cerebral or meningeal involvement. UDOH lab relies on clinicians to select those who are suspected of central nervous system involvement. Testing for others is available at most large reference laboratories on a fee-for-service basis.

- The most efficient diagnostic method is detection of IgM antibody to WNV in serum or cerebral spinal fluid (CSF) collected within 8 days of illness onset using the IgM antibody capture enzyme-linked immunosorbent assay (MAC-ELISA).
- IgM antibody in CSF strongly suggests central nervous system infection.
- Patients who have been recently vaccinated against or recently infected with related flaviviruses (e.g., yellow fever, Japanese encephalitis, dengue) may have positive WNV MAC-ELISA results. Convalescent sera or other tests may be needed to confirm WNV infection.

Specimens

Serum:

- IgM antibody capture ELISA
- Collection of acute and convalescent (i.e., 2–4 weeks after acute sample) sera is encouraged.
- Positive tests are forwarded to the Centers for Disease Control and Prevention for confirmation.
- Shipping protocol:
 - Collect serum in red-topped tubes or serum separators; spin prior to transport.
 - Transport at 2–8° C. If transport will be delayed for several days, serum may be frozen.
 - Send to the UDOH laboratory at 46 North Medical Drive, Salt Lake City, UT 84113.

CSF:

- IgM antibody capture ELISA
- Shipping protocol:
 - Collect per established protocol of individual institution.
 - Transport directly to the UDOH laboratory at room temperature.
 - If CSF transport is delayed, store at 2–8° C.

**REPORTING**

Report suspected WNV Infection to your local health department or the Utah Dept of Health:

1-888-EPI-UTAH

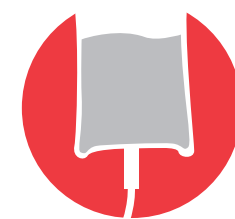
West Nile virus is a reportable disease in Utah under Section R386-702-2 of the Communicable Disease Rule.

The timely identification of persons with acute WNV or other arboviral infection may have significant public health implications and will likely augment the public health response to reduce the risk of additional human infections.

**LABORATORY
FINDINGS**

Among patients in recent outbreaks:

- Total leukocyte counts in peripheral blood were mostly normal or elevated, with lymphocytopenia and anemia also occurring.
- Hyponatremia was sometimes present, particularly among patients with encephalitis.
- Examination of the cerebrospinal fluid (CSF) showed pleocytosis, usually with a predominance of lymphocytes, elevated protein, and normal glucose.
- Computed tomographic scans of the brain mostly did not show evidence of acute disease, but in about one-third of patients, magnetic resonance imaging showed enhancement of the leptomeninges, the periventricular areas, or both.

**TREATMENT**

Treatment is supportive, often involving hospitalization, intravenous fluids, respiratory support, and prevention of secondary infections for patients with severe disease.

- Ribavirin in high doses and interferon alpha-2b were found to have some activity against WNV in vitro, but no controlled studies have been completed on the use of these or other medications, including steroids, anti-seizure drugs, or osmotic agents, in the management of WNV encephalitis.

West Nile virus updates are available at:

<http://www.cdc.gov/ncidod/dvbid/westnile/index.htm> and www.health.utah.gov/wnv.

**PREVENTION**

Dusk and dawn are when mosquitoes that carry the virus are most active, so take precautions to prevent mosquito bites.

- Use mosquito repellents that contain DEET (N,N-diethyl-m-toluamide) when doing any outdoor activity, especially in the evening hours (follow the label instructions carefully).
- For adults use repellents containing DEET at 30–35% concentration.
- For children 2–12, use repellents containing 10% or less DEET.
- Do not use on children under the age of 2.
- Wear protective clothing like long-sleeved shirts and long pants while outdoors.
- Drain standing water around the house since it's where mosquitoes lay eggs. This includes tires, cans, flower-pots, clogged rain gutters, rain barrels, toys, and puddles.

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For additional clinical information, please refer to

Petersen LR and Marfin AA, "West Nile Virus: A Primer for the Clinician[Review]," *Annals of Internal Medicine* (August 6) 2002; 137:173-9.

For clinical and laboratory case definitions, see

"Epidemic/Epizootic West Nile Virus in the United States: Revised Guidelines for Surveillance, Prevention, and Control, 2001," at www.cdc.gov/ncidod/dvbid/westnile/surv&control.htm

